

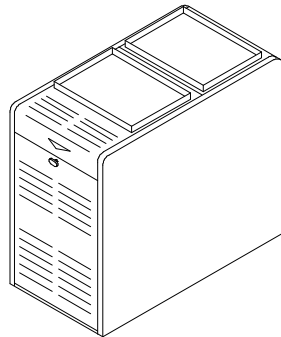


**OIL FIRED FURNACE
INSTALLATION AND OPERATION MANUAL
WITH USERS INFORMATION SECTION**

MODELS:

OL20FA151T60(B/R)

OL20RA151T60(B/R)



⚠ WARNING: IF THE INFORMATION IN THESE INSTRUCTIONS IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY, OR LOSS OF LIFE.

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

⚠ WARNING: IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE, OR MAINTENANCE CAN CAUSE INJURY OR PROPERTY DAMAGE. REFER TO THIS MANUAL. FOR ASSISTANCE OR ADDITIONAL INFORMATION CONSULT A QUALIFIED INSTALLER, OR SERVICE AGENCY.

PLEASE READ THESE INSTRUCTIONS PRIOR TO INSTALLATION, INITIAL FIRING, AND BEFORE PERFORMING ANY SERVICE OR MAINTENANCE. THESE INSTRUCTIONS MUST BE LEFT WITH THE USER AND SHOULD BE RETAINED FOR FUTURE REFERENCE BY QUALIFIED SERVICE PERSONNEL.



THERMO PRODUCTS, LLC.
PO BOX 237
DENTON, NC 27239
PHONE: 800-476-4328



MADE IN USA

I. SAFETY SECTION

This page contains various warnings and cautions found throughout the Oil Furnace Manual. Please read and comply with the statements below.

⚠WARNING: This furnace is not to be used for temporary heating of buildings or structures under construction. See Page 1.

⚠CAUTION: Do not exceed 90° rotation of the flue elbow counter clockwise right from the vertical position. See Page 2.

⚠WARNING: The predetermined fan and limit locations on all of the Thermo Pride oil fired furnaces have been tested and approved by Thermo Products, LLC. in conjunction with Underwriters Laboratories, Inc. Any attempt to relocate these safety controls or replace these safety controls with a control that is not approved, or is incompatible, may result in personal injury, substantial property damage or death. See Page 9.

⚠WARNING: The heat exchanger must be cleaned by a qualified service person See Page 9.

⚠CAUTION: **DO NOT ATTEMPT TO MAKE REPAIRS YOURSELF!** See Page 8.

⚠WARNING: The area around the furnace should be kept free and clear of combustible liquids and material, especially papers and rags. See Page 8.

⚠WARNING: NEVER burn garbage or refuse in your furnace. Never try to ignite oil by tossing burning papers or other material into your furnace. See Page 8.

⚠WARNING: Thermo Products oil furnaces are designed to burn No. 1 or No. 2 distillate fuel oil or B5 distillate fuel oil. **NEVER USE GASOLINE OR A MIXTURE OF OIL AND GASOLINE.** See Page 9.



⚠CAUTION: **DO NOT ATTEMPT TO START THE BURNER WHEN:**

1. Excess oil has accumulated,
2. The furnace is full of vapors
3. The combustion chamber is very hot.

IF ONE OR MORE OF THESE CONDITIONS EXIST, CONTACT A QUALIFIED SERVICE PERSON. See Page 9.

All installations and services must be performed by qualified service personnel.

This page contains reproductions of the various instruction and warning labels placed on the Thermo Pride Oil Furnaces. Please read and comply with the contents of these labels.

OIL-FIRED FURNACE NO. MODEL NO.

FOR USE WITH BECKETT (-B) OIL BURNER MODEL AFG TP-1031 OR
RIELLO (-R) OIL BURNER MODEL F5.
MAXIMUM INPUT 1.35 G.P.H.
REFER TO BURNER LABEL FOR CONTROL AND FUEL SPECIFICATION.

BTU/HR	INPUT 185,000	OUTPUT 153,000	115 VOLTS	60 HZ
TOTAL CURRENT AMPS			BELT DRIVE	DIRECT DRIVE
MINIMUM CIRCUIT AMPACITY			-	16.3
MAXIMUM FUSE SIZE			-	18.9
EXTERNAL STATIC PRESSURE (IN. W.C.)			-	20
MAXIMUM DESIGNED OUTLET AIR TEMPERATURE				0.20 TO 0.50

MAXIMUM DESIGNED OUTLET AIR TEMPERATURE 200°F OR LESS.
FOR INSTALLATION ON NON-COMBUSTIBLE FLOORING WITH CLEARANCES TO UNPROTECTED COMBUSTIBLE MATERIAL NOT LESS THAN:

	TOP	SIDES	REAR	FRONT	FLUE PIPE
(INCHES)	1	1	1	24	18

ROOM MUST BE LARGE AS COMPARED TO SIZE OF FURNACE.

FOR MAXIMUM EFFICIENCY (AFUE) SET BURNER COMBUSTION FOR 12% CO₂ MINIMUM AND FURNACE TEMPERATURE RISE FOR 70°F MAXIMUM.

390425/0 5577-RA
1039-01 5651-RA THERMO PRODUCTS, LLC. - P.O. BOX 237 - DENTON, NC 27239

CAUTION

RESEAL HEAT EXCHANGER ACCESS PORTS

Clean outs accessible by qualified service personnel only. Access to clean out may require removal of panel. Be certain clean out covers and/or gaskets are intact and in proper position to ensure complete seal prior to operation.

Failure to do so may result in property or equipment damage.

390528

CAUTION

ROTATING FAN BLADE!

To avoid injury from hot or moving parts, shut off the furnace and allow to cool before removing this door.

When it becomes necessary to replace or wash filter, remove the dirty filter from the racks provided and wash or replace with identical new filters.

The blower motor located behind this door may or may not require lubrication. If lubrication instructions are not shown on the motor nameplate, the motor should not be lubricated. If the nameplate indicates that the motor requires lubrication, lubricate the motor as directed or use 30 drops of SAE 20 weight oil or equivalent twice a year. Do not use a light household grade oil.

390025

WARNING

SPECIAL HOMEOWNERS INSTRUCTIONS

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to the user's information section in the manual. For assistance or additional information consult a qualified installer, service agency or the gas/oil supplier.

390055

WARNING

REINSTALL ALL PARTS!

Should this unit be disassembled all components, panels, block offs, collars, gaskets, and fasteners must be reassembled as originally factory produced.

Failure to do so may result in property damage, injury, or loss of life.

390056

All installations and services must be performed by qualified service personnel.

⚠ WARNING

PROFESSIONAL INSTALLATION AND SERVICE REQUIRED!

This unit must be installed and serviced by a qualified servicer. Failure to do so may result in property damage, injury, or loss of life.

390057

⚠ WARNING

FIRE HAZARD!

The brass jumper has been removed from this fan & limit control at the factory to separate the fan circuit from the limit circuit.

To remove the jumper on replacement controls, break with needle nose pliers and remove completely. Retain this cover with any replacement control.

Failure to remove the jumper may lead to damage to the replacement control and possible property damage, injury, or loss of life.

LG-192

CONNECT ELECTRICAL POWER (120V/60Hz/1PH) TO WIRES INSIDE THE JUNCTION BOX.

- "HOT" LINE TO WIRE #1
- "COMMON" LINE TO WIRE #2
- "GROUND" LINE TO GROUNDING SCREW

390034

⚠ WARNING

ANNUAL SERVICE REQUIRED

The following items should be inspected every year by a qualified heating servicer. (Shut off power before inspecting.) Correct any deficiencies at once. Failure to do so may result in injury, property damage or loss of life.

Heat Exchanger: Inspect for corrosion, pitting, warpage, cracks, deterioration, carbon build up and loose gaskets.

Burner: Check for correct operation, proper combustion, no fuel leakage, and replace burner oil filter.

Chimney/Vent Pipe: Inspect for restriction, loose joints, abnormal carbon build up and condensation.

Controls: Check for correct operation and proper settings, (if manually adjustable).

Periodic visual inspections should also be made by the owner during the heating season. Call a qualified heating servicer to report suspected deficiencies. (Do not attempt to make repairs yourself!)

Further owner and heating servicer responsibilities are detailed in the printed information provided with the furnace.

390399



WARNING: This product can expose you to chemicals, including Chromium, which are known to the state of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



AVERTISSEMENT: Ce produit peut vous exposer à des produits chimiques, y compris le chrome, qui sont connus dans l'état de Californie pour causer le cancer et des malformations congénitales ou d'autres problèmes de reproduction. Pour plus d'informations, visitez www.P65Warnings.ca.gov.

390341

All installations and services must be performed by qualified service personnel.

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All installations and services must be performed by qualified service personnel.

II. GENERAL INSTRUCTIONS - READ BEFORE START OF INSTALLATION

1. The heating output capacity of the furnace proposed for installation should be based on a heat loss calculation made according to the manuals provided by the Air Conditioning Contractors of America (ACCA) or the American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. (ASHRAE).
2. All local codes and/or regulations take precedence over the instructions in this manual and should be followed accordingly. In the absence of local codes, installation must conform with these instructions and regulations of the National Fire Protection Association, and to the provisions of the National Electrical Code (ANSI/NFPA 70-1999 or latest edition).
3. The installed furnace must be level and positioned in a central location with respect to outlet registers. It should be located near the chimney to minimize any horizontal run of flue pipe, which may be required.
4. A furnace installed in a residential garage must be installed so the burner and ignition source are located higher than 18 inches above the floor, unless the required combustion air is taken from the exterior of the garage. Also, the furnace must be located or protected to avoid physical damage by vehicles.

⚠WARNING: This furnace is not to be used for temporary heating of buildings or structures under construction.

5. Listed below are definitions of "COMBUSTIBLE MATERIAL" and "NON-COMBUSTIBLE MATERIAL."

COMBUSTIBLE MATERIAL:

Material made of or surfaced with wood, compressed paper, plant fibers, plastics, or other material that will ignite and burn, whether flame resistant or not.

NON-COMBUSTIBLE MATERIAL:

Material that is not capable of being ignited and burned. Such materials consist entirely of, or a combination of, steel, iron, brick, tile, concrete, slate, or glass.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

MODEL NO.	FROM SIDES OF FURNACE	FRONT	TOP & SIDES OF PLENUM	FROM THE FLUE/VENT	REAR
OL20FA151T60 OL20RA151T60	1"	24"	1"	18"	1"

The minimum clearances listed in the preceding table are for fire protection. Clearance for servicing the front of the furnace and the rear of the lowboy models should be at least 24 inches.

All installations and services must be performed by qualified service personnel.

A clearance of 24 inches is recommended for passage to all points on the furnace requiring service access.

The OL20 furnace is to be installed on non-combustible flooring only.

NOTE: When power venting a Thermo Pride oil fired furnace an isolated combustion air kit (PVB or Beckett boot) is to be used with the other manufacturers power venting system.

NOTE: On the front flue, lowboy it is possible to rotate the flue elbow (which is factory installed for vertical discharge) 90° counterclockwise from the vertical position to adapt to various venting systems. (See following page for details)

A. VENTING:

The OL series furnaces must be vented in accordance with local codes and the Standard for the Installation of Oil-Burning Equipment, NFPA 31-2001, , or the latest editions thereof.

ROTATION OF FRONT FLUE ELBOW

On the front flue, lowboy it is possible to rotate the flue elbow (which is factory installed for vertical discharge) 90° counterclockwise from the vertical position to adapt to various venting systems. (See following page for details)

⚠ CAUTION: Do not exceed 90° rotation of the flue elbow counter clockwise right from the vertical positon.

When an installation requires that the flue exit out the left hand side casing on a front flue unit, remove screw securing the 90 deg. elbow and rotate it 90° **counterclockwise**. Use Table 1 to locate the center point for the exit of the flue. Cut hole out and extend flue through side casing. A trim collar may be ordered from Thermo Products to hide the gap around the flue pipe. This trim collar is not required for operation.

All installations and services must be performed by qualified service personnel.

TABLE 1: Suggested sizes and positions of flue pipe opening on left hand side of casing.

UNIT	<u>DIA. HOLE</u>	<u>“X” DIM.</u>	<u>“Y” DIM.</u>	<u>FLUE DIA.</u>	GASKET PART#	TRIM COLLAR PART#
OL20FA151T60	7-1/2”	4-1/2”	43/1/4”	7”	300006	14132

“X” DIMENSION IS MEASURED FROM SEPARATOR PANEL.

“Y” DIMENSION IS MEASURED FROM THE BASE.

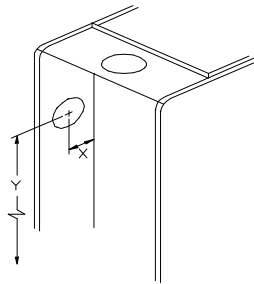


Fig 1: Recommended location for drilling hole to connect vent pipe to the furnace through the left hand side casing.

A draft regulator is supplied with the furnace and should be installed according to the regulator manufacturer’s recommendations. With the burner operating, use a draft gauge to adjust the regulator to the proper setting (refer to the instructions enclosed with draft regulator to adjust to the proper setting). When the burner air supply and draft are properly adjusted, the overfire draft should be a negative (-).01" to (-).02" WC, as measured at the 5/16" overfire air tap (See Fig. 3). This tap is provided in the upper burner mounting plate. To measure the flue draft, punch a small hole in the vent connector pipe as close to the furnace as possible and always before the draft regulator.

B. DUCT WORK/AIR CONDITIONING:

If the furnace is used in connection with summer air conditioning (cooling), the furnace should be installed parallel with or on the upstream side of the evaporator coil to avoid condensation in the furnace heat exchanger. If the cooling unit is installed with a parallel flow arrangement, dampers or other means used to control flow of air should be provided to prevent chilled air from entering the furnace. If such a damper is manually operated, it must be equipped with a means to prevent operation of either unit, unless the damper is in the full heat or cool position.

The duct system should again follow the current design standard of Air Conditioning Contractors of America (ACCA) or ASHRAE Fundamentals volume.

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The most common location for the A-shaped coil (A style) is shown in Fig. 2.

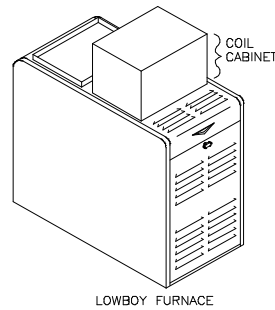


Fig 2: Acceptable locations for the air conditioner evaporator coil.

NOTICE: The minimum coil pan clearance for a sectional or drum type heat exchanger is three inches unless specified otherwise by the individual coil manufacturer.

C. BURNER INSTALLATION:

NOTICE: Remove all cardboard packing from around chamber before installing burner.

The oil burner will mount on three stud mounting bolts on the lower mounting plate covering the opening in the front of the heat exchanger. The end of the burner tube should be inserted no further than 1/4 inch back from the inside surface of the combustion chamber. A distance further than 1/4 inch back from the inside chamber wall may cause impingement and sooting.

NOTE: OVERFIRE AIR TAP MAY BE LOCATED ON EITHER SIDE OF FLAME INSPECTION COVER. (See Fig. 3).

TWO PIECE MOUNTING PLATE

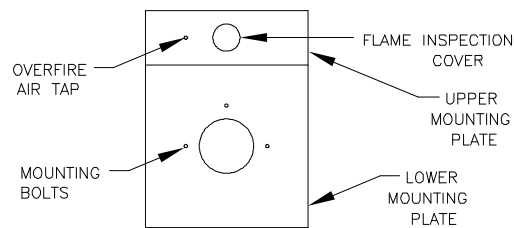


Fig. 3: Typical location of the overfire air tap

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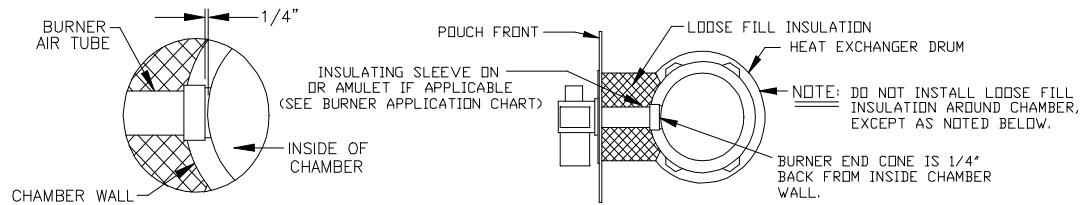


Fig. 4: (Top view) Burner insertion illustration

When mounting the burner, the upper mounting plate (Fig. 3) must be removed to provide access to the area in front of the combustion chamber. The combustion chamber can then be moved forward or backward slightly to allow for adjustment in positioning the burner tube. A fiber insulating sleeve or amulet is provided on the burner tube of specific Thermo Pride burners. (See Fig. 5). See Thermo Pride burner application chart for type of insulator. Do not allow the burner tube or end cone to physically touch or protrude into the chamber, as excess heat transfer could result in destruction of the tube, end cone or both. The burner tube/end cone is properly positioned, when the end is $\frac{1}{4}$ inch back from the inside surface of the combustion chamber wall. When installing the Riello Burner the bottom mounting plate must be changed out with the mounting plate provided with the Riello burner.

NOTE: The loose-fill insulation that is included in a brown paper bag should be lightly placed around the burner tube between the front of the combustion chamber and the burner mounting plate. (DO NOT PACK THE INSULATION DOWN). The loose-fill insulation should be placed in such a fashion that the surface of the insulation is sloped from the top of the combustion chamber to the top of the lower mounting plate. The purpose of the loose insulation is to help protect the burner tube, mounting plates and vestibule area from excessive temperatures.

CAUTION: When installing the burner, it should be noted that the loose fill insulation and fiber chambers are made with ceramic fibers. Currently, there is no known chronic health effects in humans associated with long term exposure to ceramic fibers. The International Agency for Research on Cancer (IARC) based on its review of studies that injected ceramic fiber into the abdomens of hamsters and rats have classified fibrous glass wool, mineral wool (both rock wool and slag wool) and ceramic fiber as group 2B carcinogens. A group 2B agent is considered by IARC to have the possibility of being carcinogenic to humans. IARC has also classified these fibrous materials as group 2A carcinogens when they have undergone long term exposure to temperatures greater than 18000F. A group 2A agent is considered to have the probability of being carcinogenic to humans. For these reasons, we suggest the use of a 3M 9900, 3M 8710 or equivalent mask when working with any ceramic fiber products. For further information, contact the Manager of Customer Service for Rex Roto Corporation at (517) 324-7533

All installations and services must be performed by qualified service personnel.

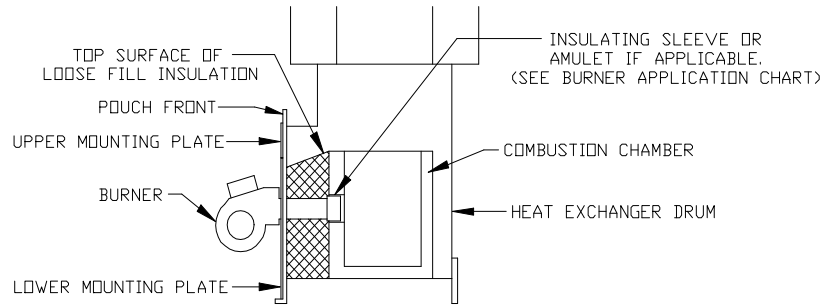


Fig. 5: (Side view) Burner insertion illustration

D. FUEL SYSTEM INSTALLATION

In situations where the oil storage tank is installed at the same level with, or above, the burner, a single oil supply line run from the oil tank to the burner will be usually be adequate. No return line will be required. If the oil tank is installed below the burner and the lift exceeds approximately 8-ft., an oil supply line and an oil return line are recommended. When connecting a return line to the pump a bypass plug must be installed in the pump, see instruction provided with the burner.

Refer to the Standard for the Installation of Oil-Burning Equipment, NFPA 31-2001, and the oil burner operating instructions for detailed information on oil storage tank & oil supply/return line installation.

NOTICE: We recommend installing a high efficiency oil filter, in the oil supply line, capable of filtering 10 to 20 micron diameter (or preferably smaller) particles from the fuel.

E. WIRING

All wiring must conform to the provisions of local codes or in the absence of these codes with the provisions of the National Electrical Code, ANSI/NFPA70 (Latest Edition).

The following items are guidelines to complete the wiring portion of the installations.

1. Install the room thermostat according to instructions provided with thermostat. Set the anticipator to .8 amps.
2. The furnace must be grounded in accordance with local codes and with the National Electrical Code, ANSI/NFPA70 (Latest Edition).

All installations and services must be performed by qualified service personnel.

III. STARTING THE UNIT

A. INITIAL OPERATION OF THE FURNACE

WARNING: To avoid possible explosion, DO NOT attempt to light the burner if:

1. Oil has accumulated in the base of the combustion chamber.
2. The furnace is full of fuel vapors.
3. The combustion chamber is very hot.

CAUTION: The oil burner must be installed and adjusted using recently (within the last year) calibrated combustion instruments by a qualified heating contractor prior to placing the furnace in operation. Refer to this manual and the oil burner instruction manual for details.

To minimize initial fuel oil and combustion odors, ventilate the building well while operating the furnace for the first time.

Do not run the oil pump dry (without oil) for more than two (2) minutes. Damage to the oil pump may result.

- 1) Turn the electrical disconnecting switch to the “OFF” position.
- 2) Set the room thermostat above room temperature.
- 3) Be sure the oil tank is full of clean # 2 fuel oil.
- 4) Open all shutoff valves in the oil line.
- 5) Turn on the electrical disconnecting switch and prime the burner oil pump according to the pump manufacturer’s instructions.
- 6) When ignition is established, make a temporary air adjustment for a clean, smoke-free flame. At this point, the final burner adjustment should be made using test **instruments to measure oil pump pressure, smoke number, carbon dioxide (CO₂), carbon monoxide (CO), draft, and flue gas temperature.**

B. BURNER ADJUSTMENT

In order to achieve the best combustion efficiency, the following procedure is recommended.

Measure the oil pump pressure. If required, adjust it to deliver the appropriate pressure for the burner. See Table 2 for correct pump pressures.

Carbon Dioxide (CO₂) and Carbon Monoxide (CO) – In order to assure that proper and safe combustion are taking place, carbon dioxide and carbon monoxide measurements must be taken. A CO₂ reading within the limits of Table 2 with no measurable CO is desirable. The maximum acceptable CO reading is less than 50 PPM. If the CO reading is too high, open the burner air shutter, or air band, slightly to permit more combustion air to the flame. Recheck the CO level and adjust as required.

Draft – Draft measurements should be taken through the overfire port and in the vent connector, not more than 12 inches away from the furnace outlet. A 5/16 in. hex washer head bolt plugs the overfire port in the burner mounting plate. Remove the bolt and insert a suitable draft measurement gage. After the chimney (or stack gas passageway) has warmed up to operating temperature, approximately 15 to 20 minutes of burner operation, adjust the barometric damper

All installations and services must be performed by qualified service personnel.

to obtain the correct overfire draft reading. See table 2. The draft measured at the flue (stack draft) should read no more than 0.05 in. W.G.

NOTICE: The overfire draft is the more important measurement and should be used to adjust the setting of the barometric draft control.

Flue Gas Temperature – The flue gas temperature will vary depending on heat input rate, air temperature rise across the heat exchanger, and air flowrate through the furnace. To prevent excessive water vapor condensation from the flue gases, the gross flue gas temperature should not fall below 330°F. In addition, if the gross flue gas temperature exceeds 550°F, the heating efficiency of the furnace will be reduced.

To reduce high flue temperatures, after properly adjusting the burner, check for blocked supply/return airflow. Remove any blockages, increase fan speed, or consider reducing the furnace heat input rate. Also, verify there is no air leakage into the combustion chamber from around the burner mounting flange or heat exchanger mounting plate. If flue gas temperatures are too low, consider increasing the heat input rate or reducing the amount of supply/return airflow.

1Cycle the furnace several times to verify the burner lights off and shutdown smoothly without excessive noise or smoke production.

Table 2: Oil Burner Application and Specifications

Furnace Model	OL20FA151T60(B/R), OL20RA151T60(B/R)	
Burner Model	Beckett AFG	Riello F5
Nozzle (GPH/Angle/Pattern)	1.35/80°/B	1.1/60°/A
Heat Output (BTUH)	153,000	153,000
Oil Pump Pressure (PSIG)	100	145
Burner Head Type	F12	Fixed
Head Protector	Sleeve	None
Head Tubualtor Setting	Z =1.25 in	Turbulator 3.5
Air Band Setting	0	NA
Air Shutter Setting	8	3.5
Overfire Draft (in. W.G.)	-.01	-.01
Smoke Spot, Maximum	0	0
CO2 (%)	11.5	11.5
CO (PPM)	< 50	< 50

C. AIRFLOW AND TEMPERATURE RISE

The supply/return airflow shall be set to obtain an air temperature rise, across the furnace, in the range of 55 to 85°F. Since the flow resistance of each duct system is slightly different, the airflow (fan speed) may have to be changed in the field to achieve a satisfactory temperature rise. One way to measure the temperature rise across the furnace is to insert temperature measuring devices (e.g. thermometers) into the return air duct and into the supply air duct about 12 inches from the furnace. After the furnace has been firing continually for over 20 minutes, read the temperature difference between the two (2) thermometers. The temperature difference should not exceed

All installations and services must be performed by qualified service personnel.

85°F, nor be less than 55°F. For better energy efficiency, a temperature rise closer to 70°F is recommended. Refer to wiring diagram for available blower speeds. Minimum return air temperature to prevent condensation in the heat exchanger is 55°F.

VI. TROUBLESHOOTING AND SERVICE

A. FAN CONTROL

This furnace is equipped with a fan timer control board. The fan operation is determined by the fan on delay and fan off time delays on the control board. In most cases the factory setting will be sufficient for performance and homeowner comfort. If adjustments are needed refer to the wire diagram in this manual or on the furnace rear door for available time delay settings.

The control also has diagnostic features. A green light will illuminate under the thermostat terminal that is being activated. Also any time the board receives a call from the thermostat a red light near the center of control will illuminate.

If a limit switch opens the red light will flash, power will be interrupted to the Burner and the circulating air blower will be energized. The blower will continue to run and the burner will not be energized after the limit closes until the blower off delay has expired.

B. LIMIT POSITION AND LOCATION

⚠WARNING: The predetermined fan and limit locations on all of the Thermo Pride oil fired furnaces have been tested and approved by Thermo Products, LLC. Any attempt to relocate these safety controls or replace these safety controls with a control that is not approved, or is incompatible, may result in personal injury, substantial property damage or death.

C. BURNER TROUBLESHOOTING

For troubleshooting the oil burner, reference the burner manufactures instructions.

D. HEAT EXCHANGER CLEANING INSTRUCTIONS

⚠WARNING: The heat exchanger must be cleaned by a qualified service person.

It is important to inspect and clean the heat exchanger once a year, or as necessary, to remove any build-up of soot. A layer of soot on the inside of the heat exchanger will act as an insulator and reduce heat transfer, resulting in less efficiency.

To clean the heat exchanger, first turn off all power to the unit. Next, remove the access panel (see below and beginning of following page) immediately above the burner (on the horizontal furnace, it will be located to the side of the burner) to gain entry to the clean-out covers, refer to figure 6. This panel is identified with a label. Remove clean-out covers, the vent connector pipe to the chimney, the burner, and the burner mounting plates. When removing the clean-out covers, special care must be taken not to damage the gaskets. Should the gaskets separate, crack, break, or be unsuitable for reuse, the gasket must be replaced before reattaching the clean-out covers.

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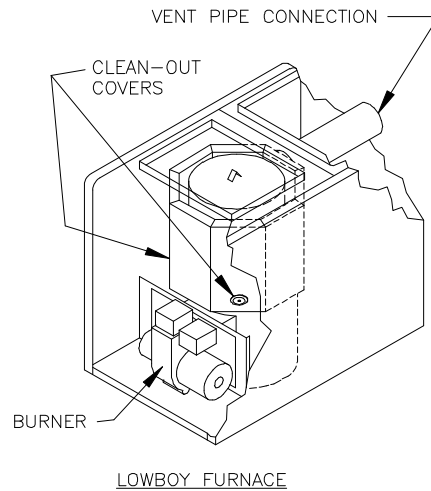


Fig. 6: Typical Heat Exchanger Cleanout Cover Locations.

With access to the inside of the heat exchanger through the burner area, clean-out openings, and vent pipe connection, it is possible to use a long, flexible wire brush and an industrial type vacuum cleaner to remove any soot build-up. **NOTE:** A one inch (outside diameter) vacuum cleaner hose will fit into the radiator.

To vacuum and brush the outer radiator of the heat exchanger, go through the clean-out openings in both directions, as shown in figure 7, below.

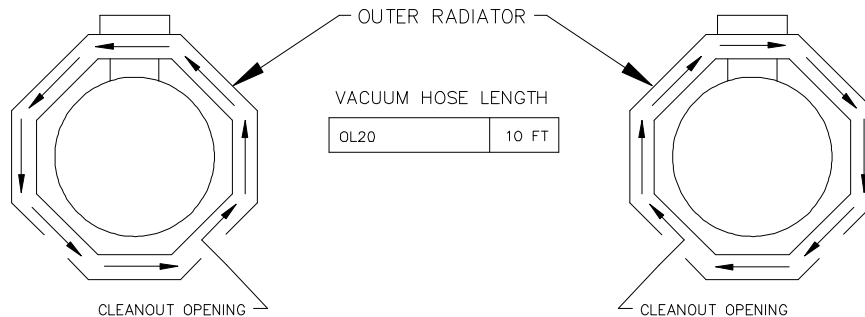


Fig. 7: Recommended method and device for cleaning inside of heat exchanger.

Reassemble the furnace to its original construction. Remount the burner being certain that the air tube is properly inserted into the chamber opening (see section D). If heavy soot deposits were found in the heat exchanger, this may indicate the burner is out of adjustment.

V. INSTALLER'S INSTRUCTIONS TO USER

After completing the installation, the installer shall inform and/or demonstrate to the homeowner:

1. The location of all the instructions in the furnace and that these instructions and the users information manual must be kept along with instructions for any accessories in the plastic pouch on the inside of the furnace.
2. The location and use of the manual oil shut off valve and furnace electrical disconnect switch. Instruct user to always shut off oil before shutting off electric power.

All installations and services must be performed by qualified service personnel.

3. The sequence of operation of the furnace.
4. The correct operation and maintenance of the appliance as outlined in the users information manual.
5. That failure to maintain and operate this furnace in accordance with these instructions could result in hazardous conditions, bodily injury, property damage and may void the limited warranty on the furnace.
6. Review with and encourage the user to read the label reproductions and all warnings and instructions outlined in this Manual.

Recommend that the user have a qualified heating contractor inspect the furnace at the start of each heating season. Inform the user of the frequency of inspection required for each item in Section III of the User's Manual

III. USERS INFORMATION SECTION

A. COMBUSTION AIR SUPPLY: The burner requires a generous amount of clean combustion air to operate safely. Lack of adequate combustion air can result in erratic operation of the burner, noisy combustion, or fuel odors in the air. Never block the furnace from the supply of combustion air. If there is an exhaust fan, dryer or return air grill in the furnace room, there should be increased concern and additional efforts may be required to provide adequate combustion oil to the furnace at all times.

B. OIL SUPPLY: Do not allow the fuel tank to run completely empty. During the summer, keep the tank full to prevent condensation of moisture on the inside surface of the tank. If the fuel tank runs completely dry, it may be necessary to purge the lines of trapped air. Contact a qualified technician to bleed the lines and restart the burner. Turn the oil supply valve off if the burner is shut down for an extended period of time.

C. INSPECTION AREAS

VESTIBULE: The furnace vestibule area or burner compartment should be inspected by removing the front door of the furnace and looking for signs of excessive heat such as discoloration of components materials damage, from rust or corrosion, soot or carbon build-up.

EXTERIOR OF FURNACE: The furnace exterior should be inspected for signs of excessive heat such as discoloration of materials and damage from rust or corrosion.

FLUE PIPE, VENT PIPE OR CONNECTOR: The furnace vent pipe should be inspected for signs of rust, corrosion pitting or holes in pipe, and leakage around seams in pipe, indicated by soot or condensate streaks.

CHIMNEY OR VENTING SYSTEM: The furnace venting system should be inspected for signs of rust, corrosion pitting or holes, and signs of condensation or moisture leakage from the venting system.

If any of the above symptoms are evident, call a qualified heating contractor for assistance.

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⚠CAUTION: Do not attempt to make repairs yourself.

⚠WARNING: The area around the furnace should be kept free and clear of combustible liquids and material, especially papers and rags.

⚠WARNING: never burn garbage or refuse in your furnace. Never try to ignite oil by tossing burning papers or other material into your furnace.

⚠WARNING: Thermo Products oil furnaces are designed to burn No. 1 or No. 2 distillate fuel oil or B5 distillate fuel oil. Never use gasoline or a mixture of oil and gasoline.

⚠CAUTION: **DO NOT ATTEMPT TO START THE BURNER WHEN:**

1. Excess oil has accumulated.
2. The furnace is full of vapors
3. The combustion chamber is very hot.

If one or more of these conditions exist contact a qualified service person.

D. STARTING THE BURNER:

1. Turn the main service switch to "OFF" position.
2. Set thermostat substantially above room temperature.
3. Open shut-off valves in oil supply line to burner.
4. Turn service switch to furnace "ON". If burner starts and runs, but stops again on lockout, it may be necessary to bleed the lines or make burner combustion air adjustments. Contact a qualified service person to adjust and start burner.

E. FILTER CLEANING AND LOCATION

⚠WARNING: To avoid injury from moving parts, hot surfaces, or electrical shock, shut off the power to the furnace before removing any furnace access doors to service the air filters.

The air filters should be inspected each month and cleaned when dirty. Cleaning the air filters frequently may reduce airborne contaminants from entering the furnace and depositing in the furnace, duct system and home. To clean a dirty filter, first remove the blower compartment door at the rear of the furnace, refer to figure 8. Remove the dirty filter from the filter rack and clean it with a mild soap and water solution. Make sure filter is thoroughly dry before replacing. Replace the blower compartment door.

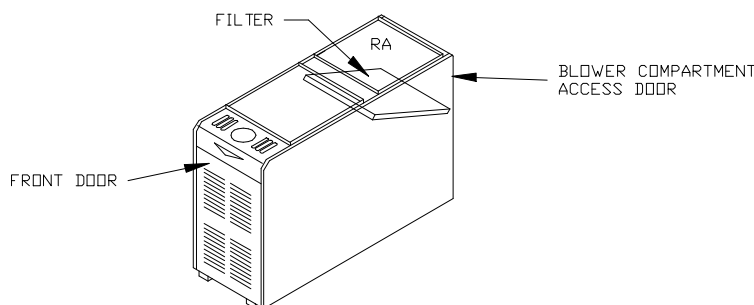


Fig. 8: Location of the air filter and blower compartment access door on the typical lowboy furnace.

All installations and services must be performed by qualified service personnel.

COMBUSTION AND EFFICIENCY TESTING FOR THERMO PRIDE OIL FIRED CENTRAL FURNACES.

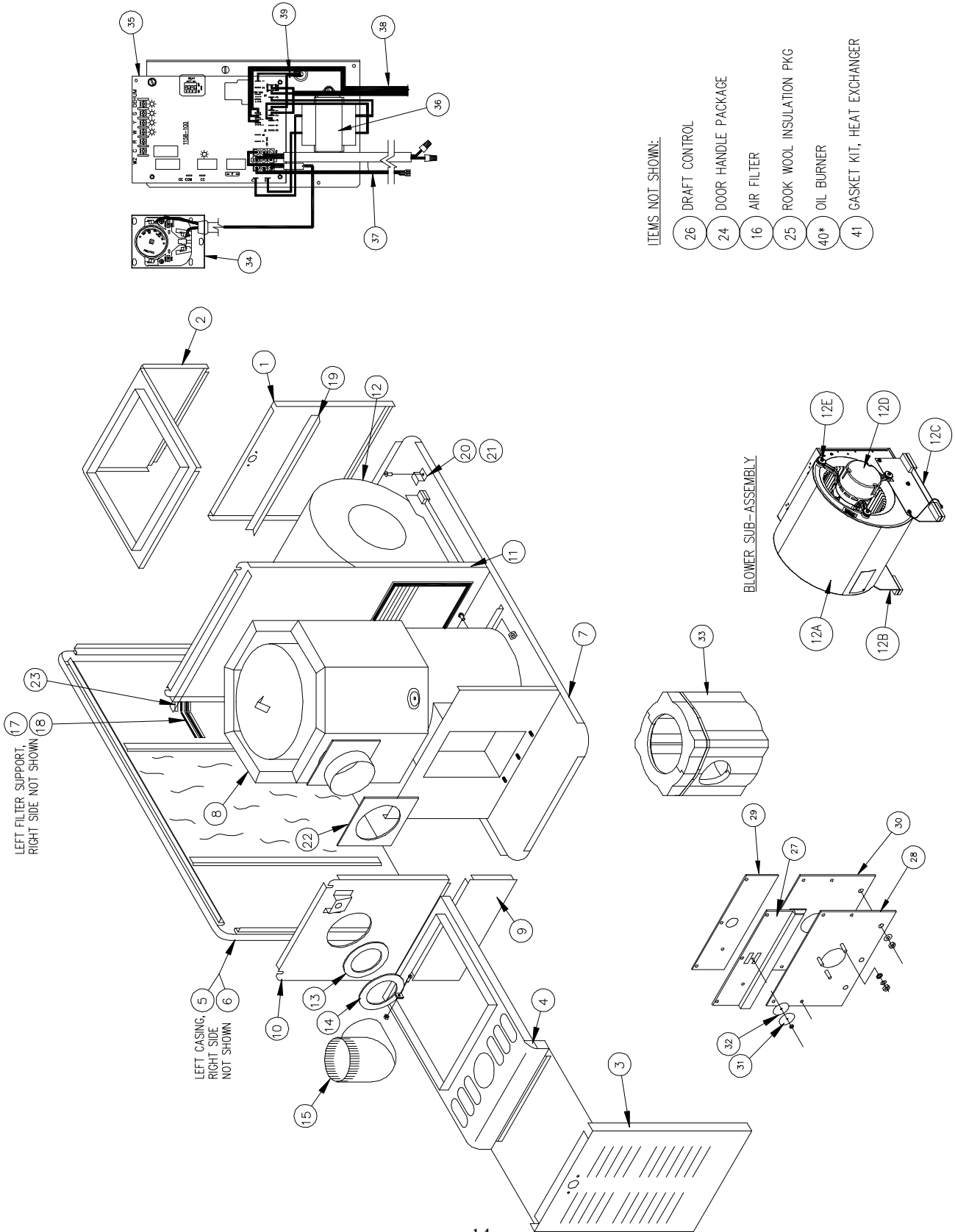
Complete this form for each Thermo Pride furnace installed. Read instruction manual carefully before making tests. Retain this form with furnace.

CUSTOMER	NAME				
	ADDRESS				
	CITY, STATE				
HEATING SYSTEM	FURNACE MODEL				
	FURNACE SERIAL				
	BURNER MODEL NO.				
	TYPE OF VENTING & OIL SYSTEM (CHECK ALL THAT APPLY)				
	<input type="checkbox"/> MASONRY CHIMNEY <input type="checkbox"/> CLAY LINER <input type="checkbox"/> MAKE UP AIR TO MECANICAL ROOM <input type="checkbox"/> METAL CHIMNEY <input type="checkbox"/> METAL LINER <input type="checkbox"/> DIRECT VENT <input type="checkbox"/> DRAFT CONTROL <input type="checkbox"/> SIDEWALL POWER VENTER <input type="checkbox"/> COMBUSTION AIR KIT <input type="checkbox"/> FUEL FILTER <input type="checkbox"/> 2 PIPE SYTEM				
COMBUSTION TEST Operate burner for at least 10 min. before taking readings.		INITIAL	SERVICE	SERVICE	SERVICE
	CO ₂ (%)				
	O ₂ (%)				
	CO (PPM)				
	SMOKE NO.				
	DRAFT - BREECH (IN W.C.)				
	DRAFT - OVERFIRE (IN W.C.)				
	GROSS FLUE TEMP (°F)				
	ROOM TEMP (°F)				
	EFFICIENCY (%)				
	SUPPLY TEMP (°F)				
	RETURN TEMP (°F)				
	TEMP RISE (°F)				
	NOZZLE (GPH/ANGLE/CONE)				
	PUMP PRESS (PSI)				
	SAFTEY CONTROL OPERATION				
	CHECK FOR LEAKS				
TECHNICIAN					
DATE					
INSTALLER	NAME	ADDRESS		PHONE	

All installations and services must be performed by qualified service personnel.

APPENDIX-A Replacement Parts List

Replacement Parts for OL20FA151T60



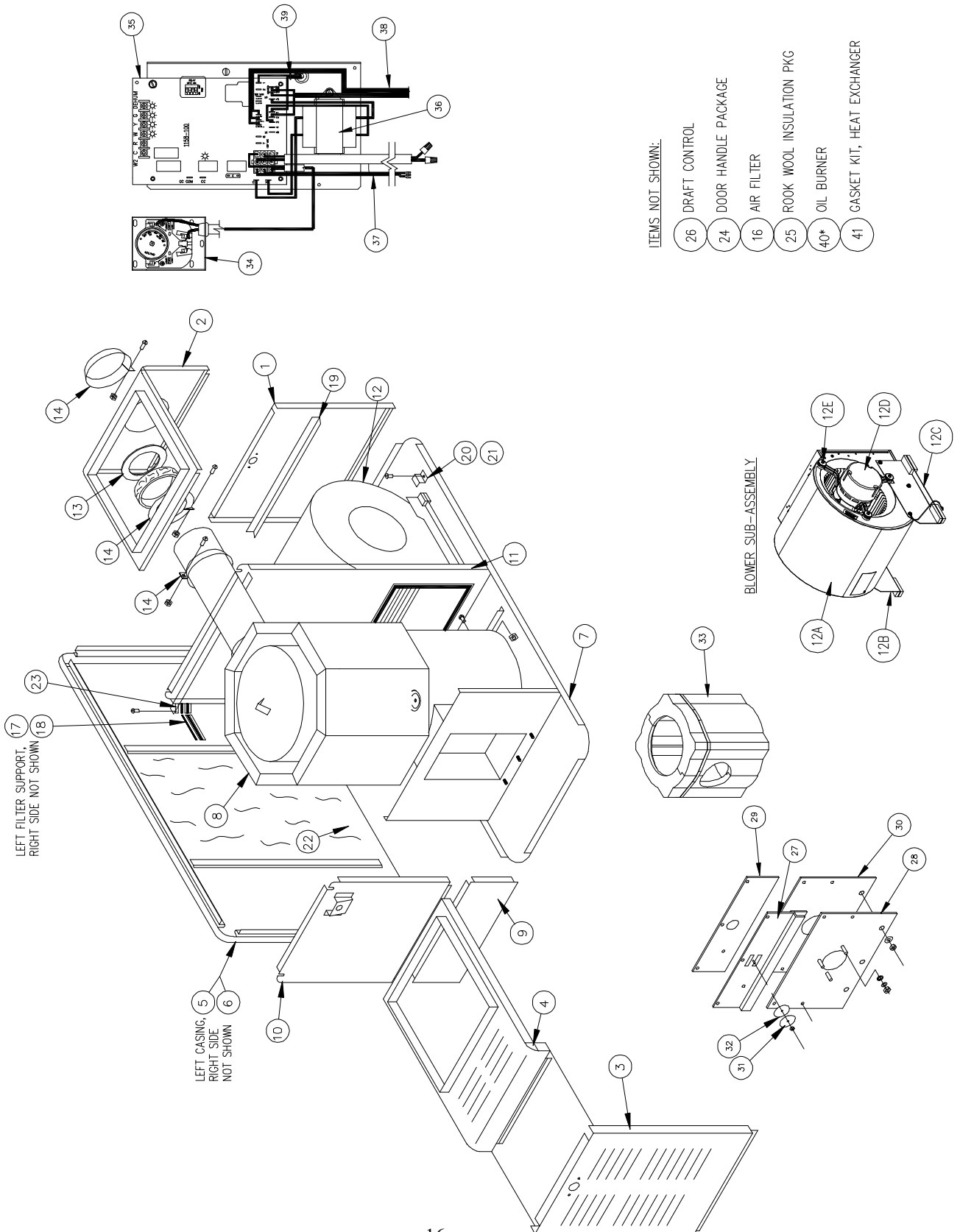
All installations and services must be performed by qualified service personnel.

ITEM	PARTS DESCRIPTION	UNIT	
		OL20FA151T60	
		PART NO.	QTY.
1	BLOWER ACCESS DOOR, LESS HANDLE	50082	1
2	TOP REAR SECTION	620422	1
3	FRONT DOOR, LESS HANDLE	50080	1
4	TOP FRONT SECTION	50077	1
5	SIDE CASING (LEFT)	620010	1
6	SIDE CASING (RIGHT)	50076	1
7	BASE	20466	1
8	HEAT EXCHANGER	31501	1
9	FRONT CENTER SEPARATOR	621054	1
10	FRONT TOP SEPARATOR	621041	1
11	REAR SEPARATOR	21049	1
12	BLOWER ASSEMBLY	50083	1
12A	BLOWER HOUSING W/ WHEEL	340080	1
12A1	BLOWER WHEEL	340083	1
12B	BLOWER LEG, LEFT	14314	1
12C	BLOWER LEG, RIGHT	14315	1
12D	MOTOR	351040	1
12E	MOTOR MOUNTING BRACKET ASS'Y	AOPS7670	1
13	FLUE COLLAR GASKET	330006	1
14	DRAW COLLAR	14132	1
15	FLUE ELBOW	35721	1
16	FILTER	370036	2
17	FILTER SUPPORT (LEFT)	624721	1
18	FILTER SUPPORT (RIGHT)	624722	1
19	REAR FILTER SUPPORT	614726	1
20	BLOWER HOLD DOWN	14113	1
21	BLOWER HOLD DOWN	14114	1
22	FLUE BACKING PLATE GASKET	330023	1
23	CENTER FILTER SUPPORT	614724	1
24	DOOR HANDLE PKG	AOPS7578	2
25	ROCK WOOL INSUL PKG	AOPS7575	1
26	DRAFT REGULATOR	370106	1
27	TOP MTG PLATE	AOPS7593	1
28	BOTTOM MTG PLATE, BECKETT	AOPS7594	1
	BOTTOM MTG PLATE, RIELLO	RMP	1
29	TOP MTG PLATE GASKET	330055	1
30	BOTTOM MTG PLATE GASKET	330056	1
31	4" INSPECTION GASKET	330009	1
32	INSPECTION COVER	15794	1
33	CHAMBER	AOPS7324	1
34	FAN & LIMIT CONTROL	350124	1
35	FURNACE CONTROL	AOPS8380	1

ITEM	PARTS DESCRIPTION	UNIT	
		OL20FA151T60	
		PART NO.	QTY.
36	TRANSFORMER	350405	1
37	HARNESS, VESTIBULE	350916	1
38	HARNESS, BLOWER MOTOR	350269	1
39	HARNESS, FURNACE POWER	350919	1
40A	BURNER, BECKETT AFG	380739	1
40B	BURNER, RIELLO F5	ROB-20	1
41	GASKET KIT, HEAT EXCHANGER	AOPS7701	1

All installations and services must be performed by qualified service personnel.

Replacement Parts for OL20RA151T60



All installations and services must be performed by qualified service personnel.

ITEM	PARTS DESCRIPTION	UNIT	QL20RA151T60	
			PART NO.	QTY.
1	BLOWER ACCESS DOOR, LESS HANDLE		50082	1
2	TOP REAR SECTION		50079	1
3	FRONT DOOR, LESS HANDLE		50080	1
4	TOP FRONT SECTION		50078	1
5	SIDE CASING (LEFT)		620010	1
6	SIDE CASING (RIGHT)		50076	1
7	BASE		20466	1
8	HEAT EXCHANGER		31500	1
9	FRONT CENTER SEPARATOR		621054	1
10	FRONT TOP SEPARATOR		621044	1
11	REAR SEPARATOR		21052	1
12	BLOWER ASSEMBLY		50083	1
12A	BLOWER HOUSING W/ WHEEL		340080	1
12A1	BLOWER WHEEL		340083	1
12B	BLOWER LEG, LEFT		14314	1
12C	BLOWER LEG, RIGHT		14315	1
12D	MOTOR		351040	1
12E	MOTOR MOUNTING BRACKET ASS'Y		AOPS7670	1
13	FLUE COLLAR GASKET		330006	1
14	DRAW COLLAR		14132	3
15	-		-	-
16	FILTER		370036	2
17	FILTER SUPPORT (LEFT)		624721	1
18	FILTER SUPPORT (RIGHT)		624722	1
19	REAR FILTER SUPPORT		614726	1
20	BLOWER HOLD DOWN		14113	1
21	BLOWER HOLD DOWN		14114	1
22	-		-	-
23	CENTER FILTER SUPPORT		614724	1
24	DOOR HANDLE PKG		AOPS7578	2
25	ROCK WOOL INSUL PKG		AOPS7575	1
26	DRAFT REGULATOR		370106	1
27	TOP MTG PLATE		AOPS7593	1
28	BOTTOM MTG PLATE, BECKETT		AOPS7494	1
	BOTTOM MTG PLATE, RIELLO		RMP	1
29	TOP MTG PLATE GASKET		330055	1
30	BOTTOM MTG PLATE GASKET		330056	1
31	4" INSPECTION GASKET		330009	1
32	INSPECTION COVER		15794	1
33	CHAMBER		AOPS7324	1
34	FAN & LIMIT CONTROL		350124	1
35	FURNACE CONTROL		AOPS8380	1

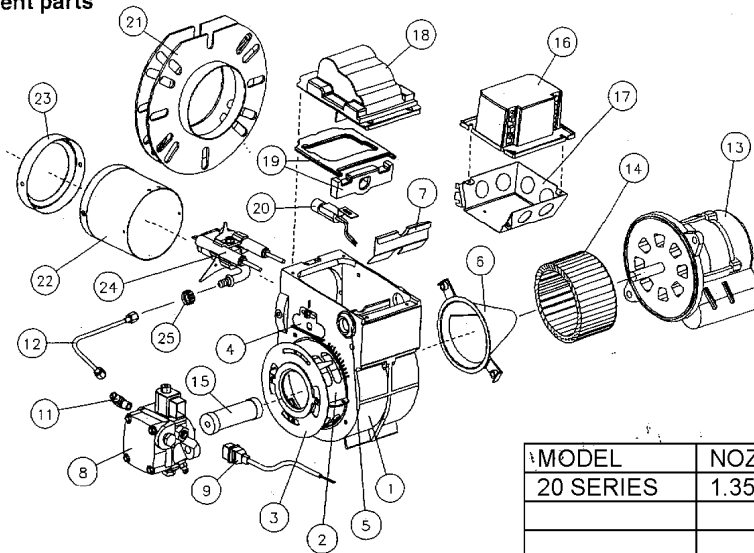
ITEM	PARTS DESCRIPTION	UNIT	QL20RA151T60	
			PART NO.	QTY.
36	TRANSFORMER		350405	1
37	HARNESS, VESTIBULE		350916	1
38	HARNESS, BLOWER MOTOR		350269	1
39	HARNESS, FURNACE POWER		350919	1
40A	BURNER, BECKETT AFG		380739	1
40B	BURNER, RIELLO F5		ROB-20	1
41	GASKIT KIT, HEAT EXCHANGER		AOPS7701	1

All installations and services must be performed by qualified service personnel.

Replacement Parts for Beckett Burner

TP 1031 AFG BURNER PART# 380739

Replacement parts



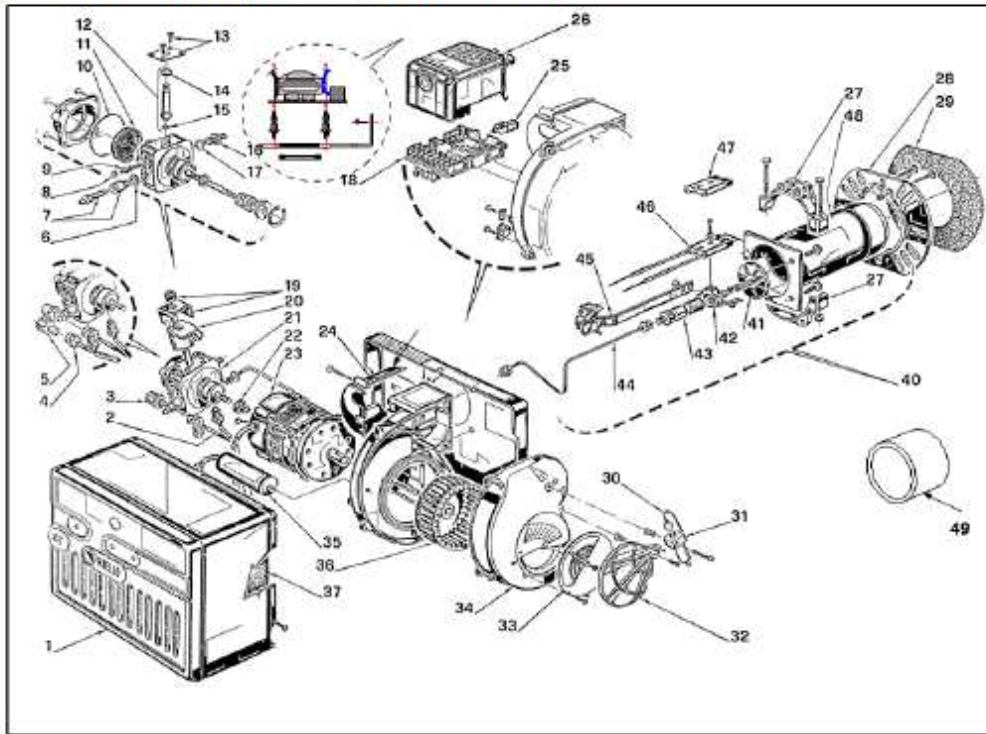
MODEL	NOZZLE SIZE	PART #
20 SERIES	1.35 x80° B	380378

ITEM	DESCRIPTION	BECKETT PART #	TP PART #
1	BURNER HOUSING ASSY.	5874MR	
2	AIR BAND ASSY. SETTING - 0	5151501	
3	AIR SHUTTER, 4 SLOT, SET @ 8	3709U	380289
4	ESCUTCHEON PLATE	3493	
	SCREW		
5	HOLE PLUG		
6	AIR GUIDE	31231U	
7	LOW FIRING RATE BAFFLE	5880	
8	PUMP 100PSI	21844	380674
	SOLENOID	21755	380654
9	VALVE CORD SET	21807	380653
11	PUMP ELBOW	2256	320815
12	CONNECTION TUBE	5394	380107
13	MOTOR 1/7 HP 3450 RPM	21805E	380644
14	BLOWER WHEEL 4 1/4 X 2 7/16 TAB	2999	380271
15	COUPLING	2454	380241
16	PRIMARY CONTROL R7184B	7456	350431
17	ELECTRICAL BOX	5770	
18	IGNITER W/ GASKETS	51771U	380645
19	IGNITER GASKET KIT		
20	CAD CELL w/ Socket C554A1919	7006Q	350104
21	FLANGE	3634BK	380265
	GASKET	31653	380270
22	AIR TUBE COMBINATION	AF76XOOS	
	AIR TUBE ONLY		380273
23	HEAD F-12	360012	380262
	SLEEVE	31581	AOPS0511
24	ELECTRODE NOZZLE ASSY		380282
	ELECTRODES PAIR	5780	380269
	STATIC PLATE, 2 3/4 U	3383	380330
25	SPLINED NUT	3666	

All installations and services must be performed by qualified service personnel.

Replacement Parts for Riello F5 Burner

Riello F5 C8512401, TP Part# 380216 Parts List



Model	Nozzle Size	Part#
OL20	1.10-60° A	380397

No.	Description	TP Part #	Riello #	No.	Description	TP Part #	Riello #
1	Burner Cover	380732	3007233	25	Photocell	380628	300228
2	Pipe Connector Supply		3006992	26	Primary Control	380627	C7001029
3	3/8" Metric M. Adapter		3006571	27	Semi Flange (2 Required)		3005854
4	Pipe Connector Return		3006993	28	U. Mounting Flange		3005855
5	1/4" Metric F. Adapter		3005847	29	Mounting Gasket	380270	3005856
6	Crushable Washer 3/8"		3007077	30	Capillary Tube		C7001059
7	Bleeder		3007568	31	Hydraulic Jack	380688	3006911
8	O-Ring Pump Regulator		3007028	32	Hydraulic Air Shutter		3000878
9	Regulator Screw		3007202	33	Manual Air Shutter		3007204
10	O-Ring - Pump Cover		3007162	34	Air Intake Housing		3007208
11	Pump Screen		3005719	35	Capacitor 12.5µF		3005844
12	Valve Stem		3006925	36	Fan	380629	3005708
13	Valve Stem Plate		3007203	37	Acoustic Liner		C6950050
14	O-Ring - Stem Upper		3007029	40	Short Comb. Head 6"		3948973
15	O-Ring - Stem Lower		3007156	41	Turbulator Disc		3006977
16	Nozzle Outlet Fitting		3007268	42	Electrode Support		3006966
17	Crushable Washer 5/8"		3007087	43	Nozzle Adapter		3006965
18	Primary Control Sub-Base		3002278	44	Nozzle Oil Tube - Short		3006973
19	Coil U-Bracket Nut		3006553	45	Regulator Assembly		3006323
20	Coil	380719	3002279	46	Electrode Assy. - Short	380631	3006329
21	Pump	380633	3007802	47	Electrode Porcelain		3005869
22	Pump Drive Key		3000443	48	Air Tube only	380709	3007594
23	Motor 120 VOLT 60Hz	380630	3005843	49	Amulet - Sleeve Kit	380443	C7001033
24	Air Tube Cover		3007316	NA	AL1008 24V Relay Kit	380226	C7001085

051320A

All installations and services must be performed by qualified service personnel.

APPENDIX-B Wiring Diagrams

